

Application Serial No.: 10/004,363
Amendment and Response to May 5, 2004 Office Action

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REMARKS

Claims 1-3, 5-14, 16-18 and 20-29 are in the application, with Claim 15 having been cancelled, Claims 24-29 having been added, and with Claims 1, 12, 13 and 17, the independent claims herein, each having been amended. No new matter has been added. Reconsideration and further examination are respectfully requested.

Applicants gratefully acknowledge the courtesies offered to Applicants' representative during an October 5, 2004 telephone interview. The amendments and remarks herein were prepared in direct view of the Examiner's comments during the interview.

Double Patenting Rejections

Claims 1-3, 5-18 and 20-23 stand rejected for obviousness-type double patenting over the claims of U.S. Patent No. 6,535,574 and over the claims of U.S. Patent Application Serial No. 10/051,088. Again, Applicants currently intend to file Terminal Disclaimers to obviate the rejections once the present application is otherwise deemed to be in condition for allowance.

Prior Art Rejections

Claims 1-3, 5-18 and 20-23 stand rejected under 35 U.S.C. §102 as allegedly anticipated by U.S. Patent No. 6,405,072 to Cosman. Reconsideration and withdrawal of the rejection are respectfully requested.

Claims 1 and 17

Amended independent Claim 1 relates to a method including acquisition of first three-dimensional surface data representing at least a portion of a patient's body while the patient is in a first position substantially maintained during a computed tomography scan, and acquisition of second data independent from the first data and representing at least one internal three-dimensional portion of the patient's body while the patient is in the first position. The method also includes acquisition of third three-dimensional surface data representing at least the portion of the patient's body while the patient is in a second position, wherein the second position is

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substantially maintained in preparation for radiation treatment, and comparison of the first position and the second position based on the first data and the third data.

As set forth during the interview, Cosman is not seen to describe the features of amended Claims 1 and 17. Cosman describes acquiring scan data (see, for example, col. 3, lines 29-32, col. 5, line 56 through col. 6, line 12, and col.12, line 66 through col. 13, line 19), and determining surface data from the scan data (see, for example, col. 5, line 56 – col. 6, line 12, and col.12, line 66 – col. 13, line 19). Then, at a future time and/or location, new surface data is acquired in relation to a device (e.g. LINAC machine L, image scanning apparatus 191), and the new surface data is correlated to the previously-acquired scan data and surface data to provide the location of a target with respect to the device.

Applicants agree with the Examiner's assertion that Cosman describes the acquisition of surface data. Applicants also agree that Cosman describes using such surface data to determine a target location that is defined by previously-acquired scan data and surface data. However, nowhere can Cosman be seen to disclose or to suggest any system in which first three-dimensional surface data representing at least a portion of a patient's body is acquired while the patient is in a first position substantially maintained during a computed tomography scan, second data is acquired independent from the first data and representing at least one internal three-dimensional portion of the patient's body while the patient is in the first position, and wherein the first and second data are used to compare a later-established patient position to the first position.

FIG. 11 of Cosman shows a system to position a patient for internal scanning. The system includes CT, MRI or PET scanner 191 and camera system C5. Col. 20, line 53 describes the system's use of "prior scan image data" to locate a target within the patient. As described above, this "prior scan image data" clearly consists of internal scan data and surface data determined from the scan data.

Of course, scanner 191 may be used to acquire internal scan data and camera system C5 may be used to acquire surface data. However, contrary to the language of Claims 1 and 17, FIG. 11 does not also disclose acquisition of third three-dimensional surface data representing at least a portion of the patient's body while the patient is in a second position substantially maintained in preparation for radiation treatment, and comparison of the first position and the second position based on the first data and the third data. Moreover, nowhere does Cosman

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mention combining the system of FIG. 11 with the Linac-based systems shown therein in a manner that would anticipate Claims 1 and 17.

Claims 1 and 17 are therefore believed to be in condition for allowance. Withdrawal of the rejections of Claims 1, 17 and their respective dependent claims is therefore respectfully requested.

Claim 12

Amended independent Claim 12 relates to a method including acquisition of computed tomography data of a patient while the patient remains substantially in a first position, acquisition of first three-dimensional surface data of the patient independent from the computed tomography data while the patient remains substantially in the first position, and determination of a radiation treatment plan based on the computed tomography data, the three-dimensional data, and data representing a physical layout of a radiation treatment station. The method further includes acquisition of second three-dimensional surface data of the patient while the patient remains substantially in a second position at the radiation treatment station, determination of whether the second three-dimensional data corresponds to the first three-dimensional data, and delivery of radiation to the patient according to the radiation treatment plan if it is determined that the second three-dimensional data corresponds to the first three-dimensional data.

Generally, Cosman does not describe any system to acquire computed tomography while a patient remains substantially in a first position, to acquire three-dimensional surface data independent from the computed tomography data while the patient is in the first position, to acquire second three-dimensional surface data while the patient is in a second position, and to determine whether the second three-dimensional data corresponds to the first three-dimensional data.

Cosman, rather, is seen to describe acquiring scan data, and determining surface data from the scan data. Then, at a future time and/or location, new surface data is acquired in relation to a device (e.g. FIGS. 1, 2, 5-8, and 11), and the new surface data is correlated to the previously-acquired scan data and surface data to provide the location of a target with respect to the device. Cosman does not disclose or suggest any determination of whether the second three-dimensional data corresponds to first three-dimensional data that is acquired independent from

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computed tomography data. Claim 12 is therefore believed to be in condition for allowance and withdrawal of the rejection thereof is respectfully requested.

Claim 13

Amended independent Claim 13 concerns a system which includes a computed tomography scanning device for acquiring computed tomography data of a patient while the patient is in a scanning position, a first surface photogrammetry device for acquiring first three-dimensional surface data of at least a portion of the patient's body independent from the computed tomography data while the patient is in the scanning position, a radiation treatment device for delivering radiation to the patient, a second surface photogrammetry device for acquiring second three-dimensional surface data of at least the portion of the patient's body while the patient is in a treatment position on the radiation treatment device, and a controller for determining if the treatment position corresponds to the scanning position based on the first three-dimensional surface data and the second three-dimensional surface data.

Cosman is not seen to disclose the foregoing features of amended independent Claim 13. Each embodiment of Cosman describes a single device (i.e., LINAC machine L or image scanning apparatus 191) that is used to produce surface data while a patient is in a treatment position. This surface data is compared to surface data that was generated from previously-acquired scan data. In contrast, Claim 13 requires a controller for determining if a treatment position corresponds to a scanning position based on first three-dimensional surface data acquired independent from computed tomography data while a patient is in the first scanning position and second three-dimensional surface data acquired while the patient is in the treatment position.

Accordingly, Cosman cannot be read to describe a system including a scanning device for acquiring computed tomography data of a patient while the patient is in a scanning position, a first surface photogrammetry device for acquiring first three-dimensional surface data of at least a portion of the patient's body independent from the computed tomography data while the patient is in the scanning position, a radiation treatment device for delivering radiation to the patient, a second surface photogrammetry device for acquiring second three-dimensional surface data of at least the portion of the patient's body while the patient is in a treatment position on the radiation treatment device, and a controller for determining if the treatment position corresponds to the

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scanning position based on the first three-dimensional surface data and the second three-dimensional surface data. Claim 13 is therefore believed to be in condition for allowance, and withdrawal of the rejection thereof is respectfully requested.

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CONCLUSION

The outstanding Office Action presents a number of characterizations regarding each of the applied references, some of which are not directly addressed herein because they are not related to the rejections of the independent claims. Applicants do not necessarily agree with the characterizations and reserve the right to further discuss those characterizations.

For at least the reasons given above, it is submitted that the entire application is in condition for allowance and such action is respectfully requested at the Examiner's earliest convenience. Alternatively, if there remains any question regarding the present application or any of the cited references, or if the Examiner has any further suggestions for expediting allowance of the present application, the Examiner is cordially requested to contact the undersigned.

10/5/04
Date

Respectfully submitted,



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